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(54) **METHOD AND SYSTEM FOR PRESENTING METADATA DURING A VIDEOCONFERENCE**

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USPC 348/14.01–14.09, 14.11; 382/278
See application file for complete search history.

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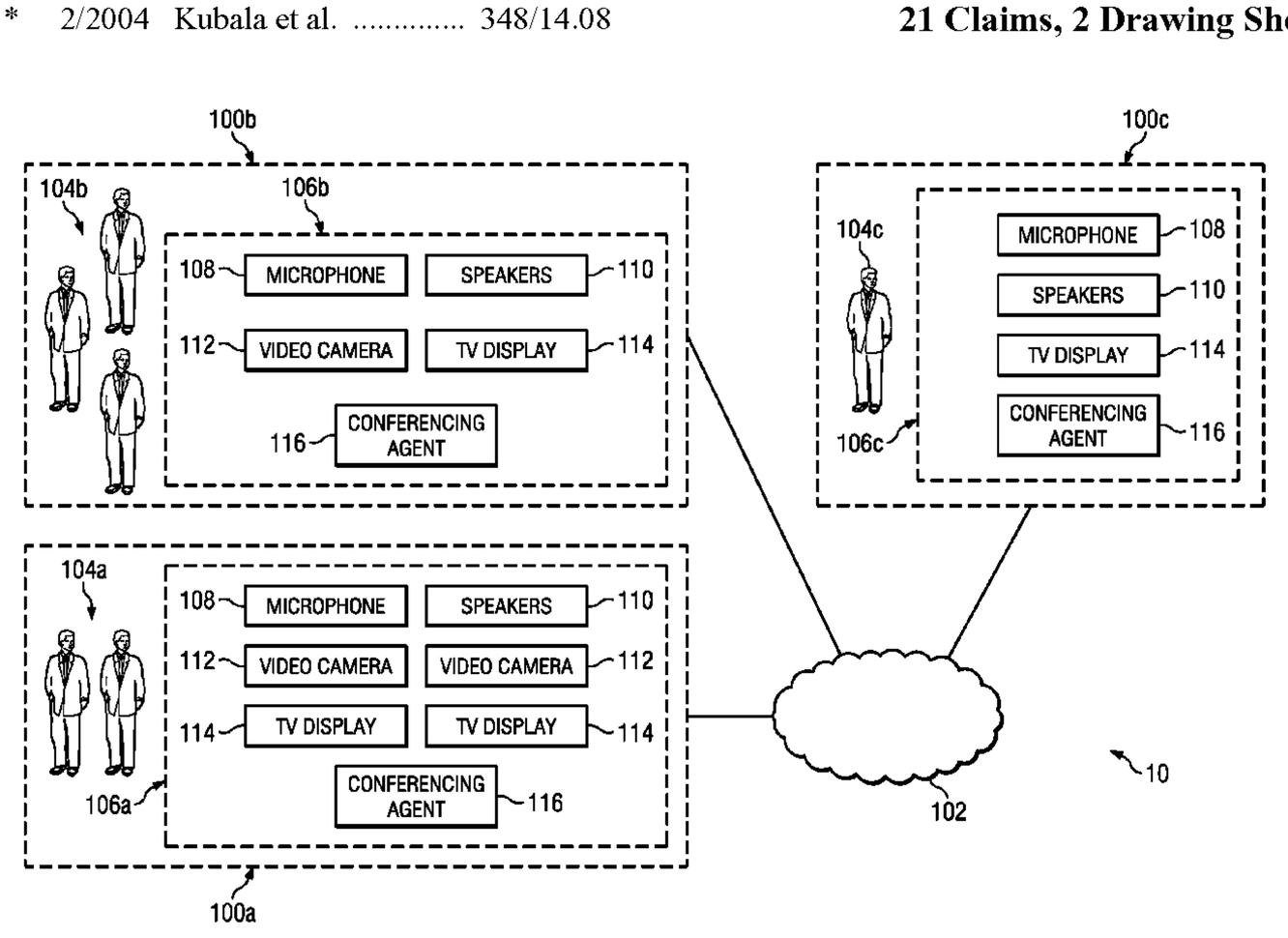
(57) **ABSTRACT**

A method for presenting metadata during a video conference includes receiving a first video conferencing stream from a first site. Metadata associated with the first video conferencing stream is identified. A second video conferencing stream incorporating the identified metadata is created using a processor. The second video conferencing stream is presented at a second site.

21 Claims, 2 Drawing Sheets



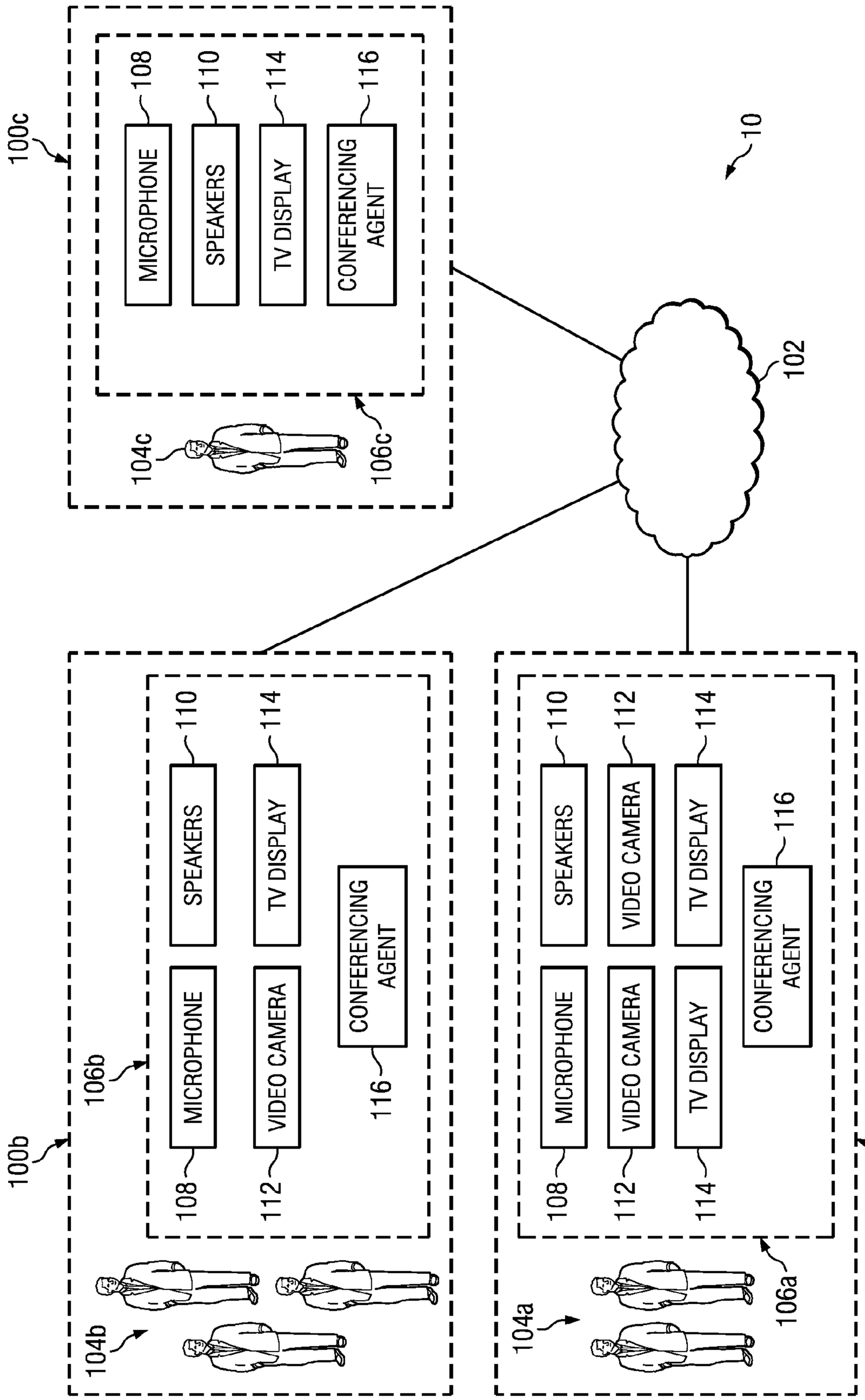

10
102
100c
MICROPHONE
108
SPEAKERS
110
TV DISPLAY
114
CONFERENCING AGENT
116
104c
106c
100b
106b
MICROPHONE
108
VIDEO CAMERA
112
SPEAKERS
110
TV DISPLAY
114
CONFERENCING AGENT
116
104b
100a
106a
MICROPHONE
108
VIDEO CAMERA
112
SPEAKERS
110
TV DISPLAY
114
CONFERENCING AGENT
116
104a

FIG. 1

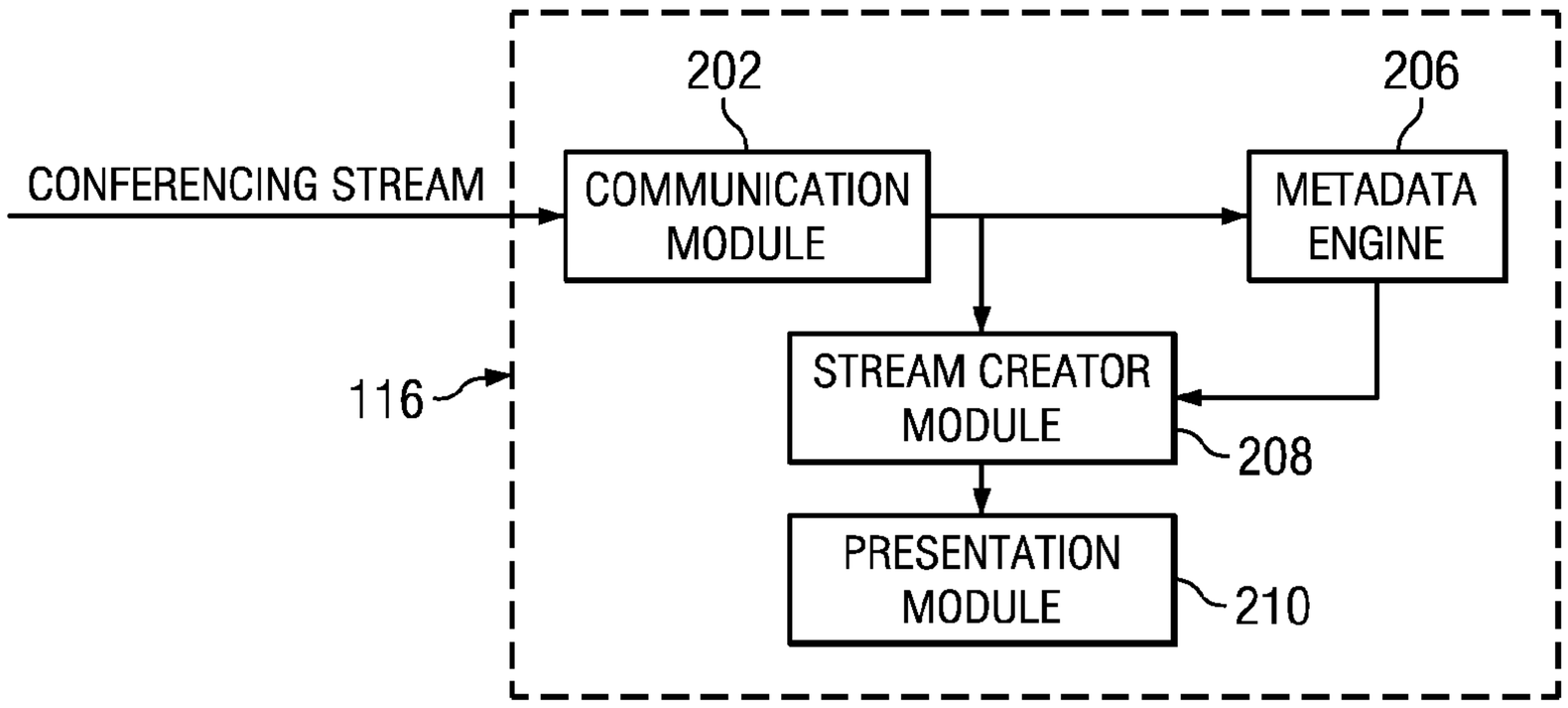

202
206
CONFERENCING STREAM
COMMUNICATION MODULE
METADATA ENGINE
116
STREAM CREATOR MODULE
208
PRESENTATION MODULE
210

FIG. 2

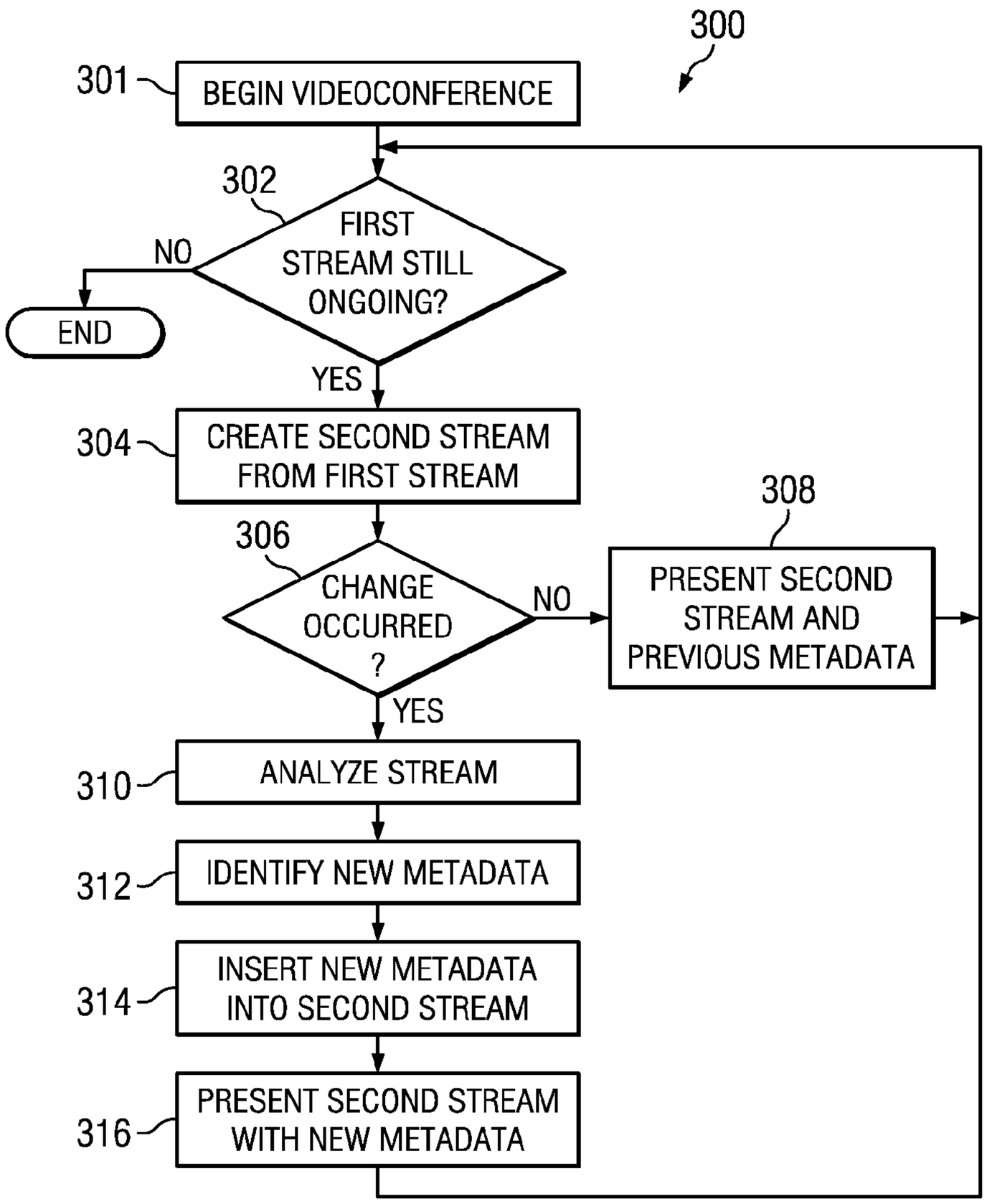

300
301
BEGIN VIDEOCONFERENCE
302
FIRST STREAM STILL ONGOING?
NO
END
YES
304
CREATE SECOND STREAM FROM FIRST STREAM
306
CHANGE OCCURRED ?
NO
308
PRESENT SECOND STREAM AND PREVIOUS METADATA
YES
310
ANALYZE STREAM
312
IDENTIFY NEW METADATA
314
INSERT NEW METADATA INTO SECOND STREAM
316
PRESENT SECOND STREAM WITH NEW METADATA

FIG. 3

METHOD AND SYSTEM FOR PRESENTING METADATA DURING A VIDEOCONFERENCE

TECHNICAL FIELD

This invention relates generally to the field of communications and more specifically to a method and system for presenting metadata during a videoconference.

BACKGROUND

Videoconferencing technology allows for individuals in disparate locations to communicate with one another. Videoconferencing provides an experience that simulates with varying degrees of success the manner in which individuals communicate in person. The emulation of in-person communication may be limited by the videoconferencing equipment used and the fact that participants may be in separate locations. The equipment used and the disparate locations of the participants, however, may provide an opportunity to surpass the experience provided during in-person communication.

SUMMARY OF THE DISCLOSURE

In accordance with the present invention, disadvantages and problems associated with previous techniques for implementing videoconferences may be reduced or eliminated.

According to one embodiment of the present invention, a method for presenting metadata during a video conference includes receiving a first video conferencing stream from a first site. Metadata associated with the first video conferencing stream is identified. A second video conferencing stream incorporating the identified metadata is created using a processor. The second video conferencing stream is presented at a second site.

Certain embodiments of the invention may provide one or more technical advantages. A technical advantage of one embodiment may include presenting information associated with a videoconference as metadata to videoconferencing participants. The metadata may be identified automatically before the video conference and/or during the videoconference. The identified metadata may be presented to the participants during the video conference and updated in real-time. The metadata may encompass any of a range of possible information, which may come from any suitable source.

Certain embodiments of the invention may include none, some, or all of the above technical advantages. One or more other technical advantages may be readily apparent to one skilled in the art from the figures, descriptions, and claims included herein.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and its features and advantages, reference is now made to the following description, taken in conjunction with the accompanying drawings, in which:

FIG. **1** illustrates an embodiment of a system operable to allow videoconferencing among various sites.

FIG. **2** is a block diagram of an example embodiment of a conferencing agent of the system of FIG. **1**.

FIG. **3** is a flowchart of an example method for presenting metadata associated with a videoconferencing stream received at a site.

DETAILED DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention and its advantages are best understood by referring to FIGS. **1** through **4** of the drawings, like numerals being used for like and corresponding parts of the various drawings.

FIG. **1** illustrates an embodiment of a system **10** operable to allow videoconferencing among various sites. In certain embodiments, several sites **100** participate in a videoconference through network **102** using videoconferencing equipment **106**. Sites **100** may include any suitable number of participants **104** who participate in the video conference. For a particular site **100**, system **10** facilitates the presentation of videoconferencing streams from other sites **100** along with certain identified metadata associated with those video conferencing streams. As described in more detail in the discussion that follows, identified metadata may include the name, business, credentials, or location of a person participating in a video conference, as non-limiting examples.

A videoconferencing stream may include any data signals, which, when rendered by videoconferencing equipment **106**, form a representation of data captured at a particular site **100**. For example, videoconferencing streams may include video and/or audio signals. Videoconferencing streams may be captured at a particular site **100** and displayed at other sites **100** relatively quickly after they are captured, i.e. in real-time. A particular site **100** may also identify metadata associated with a received videoconferencing stream. Functionality at the receiving site **100** may combine the received videoconferencing stream with the identified metadata into a new videoconferencing stream. The receiving site **100** may present the new video conferencing stream using videoconferencing equipment **106**.

Site **100** represents any location suitable to transmit, receive, and/or relay videoconferencing streams. For example, site **100** may be located in a conference room in an office, a room of a residence, or in an unenclosed space, such as a park or stadium. In addition to participants **104**, system **10** may use other items existing in the background of a videoconferencing stream transmitted from a site **100** to identify metadata associated with that stream as described in further detail below. Additionally, system **10** may rely on sources external to the received videoconferencing stream to identify metadata.

Network **102** may be any suitable communication network. By way of example, network **102** may comprise all or a portion of one or more of the following: a public switched telephone network (PSTN), a public or private data network, a local area network (LAN), a metropolitan area network (MAN), a wide area network (WAN), a local, regional, or global communication or computer network such as the Internet, a wireline or wireless network, an enterprise intranet, other suitable communication link, or any combination of any of the preceding. Network **102** may include any combination of gateways, routers, hubs, switches, access points, base stations, and any other hardware, software, or a combination of the preceding that may implement any suitable protocol for communication.

A particular site **100** includes any number of participants **104** who may engage in a videoconference facilitated by system **10**. In the embodiment illustrated in FIG. **1**, site **100***a* has two participants **104***a*. Site **100***b* has three participants **104***b*. Site **100***c* has one participant **104***c*. Participants **104** may participate in several ways. For example, a particular participant **104** may act as a speaker such that some portion of a transmitted videoconferencing stream includes the voice of the particular participant **104**. As another example, a particular participant **104** may appear in some portion of a transmitted videoconferencing stream without actively speaking. Throughout the course of a videoconference, a participant may appear and speak simultaneously, appear without speak-

ing, and/or speak without appearing in a transmitted videoconferencing stream. Note also that a particular site **100** may include any number of non-conference participants who may assist in presentation of the received video conferencing streams with identified metadata.

Videoconferencing equipment **106** facilitates videoconferencing among participants **104**. Videoconferencing equipment **106** may include any suitable elements to establish and facilitate the videoconference. For example, videoconferencing equipment **106** may include microphones, speakers, video cameras, displays, speakerphones, telephones, audio Internet Protocol (IP phones), video phone appliances, personal computer (PC) based video phones, streaming clients, a conferencing agent, and/or equipment sufficient to implement a Cisco TelePresence System or any other suitable system. In the illustrated embodiment, videoconferencing equipment **106** at the various sites **100** may include microphones **108**, speakers **110**, cameras **112**, displays **114**, and a conferencing agent **116**.

Microphones **108** include any suitable hardware and/or software to facilitate capturing sound generated at a particular site **100** and transmitting all or a portion of that sound to participants **104** located at other sites **100**. For example, the sound captured by microphones **108** may include voices of individual participants **104**.

Speakers **110** include any suitable hardware and/or software to facilitate generating audio at a particular site **100**. For example, audio generated at a particular site **100** may include audio from video conferencing streams received from other sites **100**. As another example, audio generated at a particular site **100** may include audio metadata associated with video conferencing streams received from other sites **100** and identified in accordance with the principles described in this disclosure.

Cameras **112** include any suitable hardware and/or software to facilitate capturing an image stream at a site **100** and transmitting the image stream as a part of a videoconferencing stream to other sites **100**. For example, the image stream captured by cameras **112** may include images of participants **104** and/or other items located at a particular site **100**.

Displays **114** include any suitable hardware and/or software to facilitate displaying a video conferencing stream to participants **104**. For example, video conferencing streams displayed by display **114** may include participants **104** from other sites **100** and/or metadata associated with those participants **104**. Display **114** may include a notebook PC or a wall-mounted display. Display **114** displays an image portion of a video conferencing stream using any suitable technology and/or protocol.

In certain embodiments, conferencing agent **116** may have administrative control over the videoconferencing capabilities for a particular site **100**. For example, conferencing agent **116** for a particular site **100** may initiate videoconferences with other sites **100** and facilitate receipt/transmission of videoconferencing streams from/to other sites **100**. Conferencing agent **116** may also facilitate the identification and presentation of metadata associated with received videoconferencing streams. During a videoconference, conferencing agent **116** may direct videoconferencing equipment **106** to carryout certain functions.

Conferencing agent **116** includes any suitable hardware, software, or both that operate to control and process videoconferencing streams. For example, conferencing agent **116** may comprise a programmable logic device, a microcontroller, a microprocessor, any suitable processing device, or any combination of the preceding. Conferencing agent **116** may also comprise an interface for communicating information and signals to and receiving information and signals from network **102**. This interface may be any port or connection, real or virtual, including any suitable hardware and/or software that allows videoconferencing equipment **106** to exchange information and signals with network **102**, other videoconferencing equipment **106**, and/or other elements of system **10**. Conferencing agent **116** is operable to identify metadata from any suitable source and present that metadata during a videoconference. The discussion corresponding to FIG. **2** will describe details of an example embodiment of conferencing agent **116**.

In an example embodiment of operation of system **10**, participants **104***a*, participants **104***b*, and participants **104***c* engage in a videoconference using their respective videoconferencing equipment **106**. Participants **104***a* at site **100***a* receive videoconferencing streams from site **100***b* and site **100***c*. Videoconferencing equipment **106***a* at site **100***a* includes two displays **114**. Videoconferencing equipment **106***a* may be configured to display the stream received from site **100***b* on one display **114** and display the stream received from site **100***c* on the other display **114**.

During the videoconference, the stream received from site **100***c* depicts its lone participant **104***c*. Conferencing agent **116** may use any suitable information source to identify metadata. For example, conferencing agent **116** may identify certain metadata from an entry in a calendaring or videoconferencing system database. This may be done before or during the videoconference.

In certain embodiments, conferencing agent **116** at site **100***a* analyzes the stream using face recognition software to determine the identity of the lone participant **104***c*. Conferencing agent **116** may use the determined identity to identify certain information to be displayed with the video conferencing stream as metadata. For example, it may use the identity to determine that participant **104***c* works for a certain company with a specific area of expertise. Conferencing agent may gather this information from a local database located at site **100***a* or may gather this information from a remote database accessible through network **102**. In real-time, conferencing equipment **106***a* may display the stream from site **100***c* with the identified metadata.

Conferencing agent **116** at site **100***a* may also analyze the stream received from site **100***b*. When the videoconference begins, the stream received from site **100***b* depicts one of the three participants **104***b*. Conferencing agent **116** uses face recognition technology to determine the identity of the particular participant **104***b* depicted and display metadata associated with that participant. At a point in the videoconference, two of the three participants **104***b* are depicted at the same time. Conferencing agent **116** operates to identify both of the depicted participants **104***b*. Conferencing agent **116** at site **100***a* identifies and displays the names of the depicted participants **104***b* as metadata in close proximity to their displayed personas, such that viewing participants **104***a* appreciate and associate the identified metadata with the appropriate participants **104***b*. Each conferencing agent **116** at each site **100** may perform similar analysis, identification, and presentation for each of the videoconferencing streams it receives automatically, over the duration of the video conference. As used in this document, "each" refers to each member of a set or each member of a subset of a set.

Modifications, additions, or omissions may be made to system **10** as disclosed herein without departing from the scope of the invention. For example, system **10** may include any suitable number of sites **100**. As another example, sites **100** may include any suitable number of cameras **112** and displays **114**. The components of the systems and apparatuses

may be integrated or separated. Moreover, the operations of the systems and apparatuses may be performed by more, fewer, or other components. For example, the operations of microphone **108** and camera **112** may be performed by one component, or the operations of conferencing agent **116** may be performed by more than one component. Additionally, operations of the components of system **10** may be performed using any suitable logic comprising software, hardware, and/or other logic.

FIG. **2** is a block diagram of an example embodiment of conferencing agent **116**. The illustrated embodiment shows the conferencing agent **116** receiving one or more videoconferencing streams from one or more external sources through a communication module **202**. Conferencing agent **116** identifies metadata using a metadata engine **206**. A stream creator module **208** incorporates the identified metadata and the received videoconferencing stream. A presentation module **210** facilitates presentation of the stream created by stream creator module **208** in any suitable format.

Communication module **202** includes any suitable hardware, software, or both that operate to receive video conferencing streams from external sources, such as other sites **100**. Communication module **202** may receive one or more video conferencing streams in any suitable format and according to any suitable protocol. In certain embodiments, communication module **202** also facilitates transmission of a video conferencing stream created at a particular site **100** to other sites **100**.

Metadata engine **206** includes any suitable hardware, software, or both sufficient to identify metadata associated with a videoconferencing stream. For example, metadata engine **206** may identify metadata, such as the name of conference participants or a topic of discussion, in an e-mail or a calendar entry associated with the videoconference. As another example, a person may provide metadata directly to conferencing agent **116**. Certain identified metadata may lead metadata engine **206** to identify more metadata. For example, identifying the name of a participant in an e-mail may lead metadata engine **206** to access a vCard of a particular participant. The vCard may contain the name of the business of the participant, which may be presented as metadata during the videoconference. Conferencing agent **116** may use the name of the business to identify an industry associated with the business, which may lead to the identification of other metadata, such as news articles, stock prices, and information streams (e.g., stock tickers and news feeds).

The use of a specific order in the previous example should not be seen to limit the scope of the present disclosure. Metadata may be identified in any suitable order at any suitable time. For example, metadata may be identified before the videoconference begins and/or as a part of a startup sequence for the videoconference. During the videoconference, metadata engine **206** may identify metadata from analyzing any received or transmitted videoconferencing streams. Additionally, metadata engine **206** may identify metadata from participants **104** from other sites sent along with or separate from a videoconferencing stream.

In certain embodiments, metadata engine **206** may identify a full name of a participant **104**. Metadata engine **206** may use this full name to identify alternative names of the participant **104**, such as a nickname or former name. Where used to interview a potential employee, metadata engine **206** may access all or portions of the potential employee's resume. In certain implementations, metadata engine **206** may use the identity of the participant to access a business card for the identified participant. Metadata engine may also identify a business profile associated with the participant's business. In some cases, metadata engine may access a competitive analysis of several companies in the same business as the identified participant **104**. Metadata engine **206** may coordinate with stream creator module **208** to insert the name of the identified participant **104** along with other information, such as associated business, business profile, etc, into a newly created videoconferencing stream as metadata.

Other types of metadata are possible as well. For example, metadata engine **206** may determine the originating location of a videoconferencing stream and access information about that location. Metadata engine **206** may access information on nearby shipping vendors, post offices, or banks in a videoconference where a participant **104** needs to send a package or a money order to a participant **104** at another site **100**. Metadata engine **206** may coordinate with stream creator module **208** such that a transmitting site's location and information associated with that location are inserted as metadata into a newly created videoconferencing stream.

As another example, metadata engine **206** may analyze a video conferencing stream to identify metadata associated with the stream. The analysis of the videoconferencing stream may be performed in any suitable way. Several non-limiting examples are described below.

Metadata engine **206** may perform face and/or voice recognition to identify attributes suitable to identify a person. Face recognition may comprise gathering information from the image portion of a received videoconferencing stream. Metadata engine **206** may compare the gathered information to facial information stored in a database (not shown in FIG. **2**). In certain embodiments, metadata engine **206** may employ a pattern recognition algorithm to associate an image with information stored in the database. The algorithm may require comparison of certain points of an image to certain points of images stored in the database. If a certain number of points of the image from the videoconferencing stream match the associated points of an image in a database, a face may be identified. In an example implementation, a "match" may comprise determining that any difference between a point in an image from the stream and an image from the database is within an acceptable threshold.

Voice or speech recognition may comprise gathering information from an audio portion of a received videoconferencing stream. Metadata engine **206** may compare gathered attributes from the received stream to voice or speech information stored in a database. Similar to face recognition, metadata engine **206** may perform pattern recognition and comparison until it finds a match in the database. Upon finding an unrecognized voice or speech pattern, metadata engine **206** may store attributes associated with the voice or speech pattern in a database as a new pattern. A participant **104** may then associate the new pattern with a particular person. As a variation on this type of analysis, a broader acoustic analysis may analyze the sounds of a videoconference to identify things other than a particular person. For example, an acoustic analysis may comprise identifying a song or instrument being played in the background of a videoconference.

Location recognition may comprise image recognition, audio recognition, or some combination of the two. For example, metadata engine **206** may compare the images and/or sounds in a received videoconferencing stream to image and sound information in a database. When metadata engine **206** finds a match in the database, it associates the received videoconferencing stream with a location associated with the match in the database.

One or more of these techniques may be applied to analyze a received videoconferencing stream. For example, metadata engine **206** may perform both voice and facial recognition to

identify a person. The algorithm employed by the metadata engine **206** may give any desired weight to the individual recognition techniques when determining the identity of the person in the stream. In some cases, a person speaking at a particular time during the videoconference may be different than the person that appears in the stream. In those cases, metadata engine **206** may be configured to identify both the currently "speaking" participant and the currently "appearing" participant. Metadata engine **206** may coordinate with stream creator module **208** to ensure that presented metadata distinguishes between the two.

In addition to analyzing received videoconferencing streams, metadata engine **206** may also analyze transmitted videoconferencing streams. Analysis of both received and transmitted video conferencing streams may be useful when performing subject matter recognition or when performing conversational dynamics analysis.

Subject matter or topic recognition may comprise some combination of image and/or audio recognition. For this type of analysis, metadata engine **206** associates spoken words or displayed images with subject matter or a topic of conversation. Metadata engine **206** may identify words or images spoken in both received and transmitting streams in order to identify the subject matter of conversation. The subject matter of the conversation may change over time. Thus, metadata engine **206** may identify several topics over the course of entire videoconference. Metadata engine **206** may further identify specific metadata associated with this subject matter such that it may be presented to participants at a local site when a specific topic is being discussed.

For conversational dynamics analysis, metadata engine **206** may perform some combination of image and/or audio recognition. For this type of analysis, metadata engine **206** may identify specific facial expressions and/or voice inflections, as non-limiting examples. These identified facial expressions and/or voice inflections may be associated with various predefined rules. For example, the specific rules may associate certain expressions and/or gestures with a "stressed" state or a "dishonest" state. These may be useful, for example, when an employer is interviewing a potential employee or when a business is evaluating a potential supplier via videoconference. Analyzing both received and transmitting videoconferencing streams allows metadata engine **206** to use conversational dynamics analysis to determine which participant is "dominant" or "passive" in a conversation. A participant may use this information as a cue to maintain or modify a certain conversational style in real-time during a videoconference in accordance with a desired result.

Metadata engine **206** may perform its functions at various times before or during a videoconference. For example, it may analyze a videoconferencing stream only once near the beginning of a videoconference to identify all the conference participants. As another example, metadata engine **206** may analyze a videoconferencing stream periodically or according to some predetermined schedule. The period set for periodic analysis may be set relatively small such that an analysis occurs seemingly instantaneously (i.e., in real-time) relative to a changing videoconferencing stream. Metadata engine **206** may also perform its functions in response to a sufficient change in the stream. For example, metadata engine **206** may detect that a different participant is speaking that prompts it to do further or different types of analysis (e.g., face or image recognition). A participant **104** at a local site **100** may also direct metadata engine **206** to analyze a videoconferencing stream on-demand, i.e. at any desired point during a videoconference.

As described above, metadata engine **206** may identify metadata associated with an identified subject matter or with the dynamics of a conversation to be presented during the videoconference. As an example, metadata engine **206** may operate to show statistics regarding sales of laptops where metadata engine **206** has identified laptops or laptop features as the subject matter of the conversation. Where configured to display metadata associated with conversational dynamics analysis, metadata engine **206** may access information related to the various emotional states identified by metadata engine **206**. This information may be displayed as metadata at a site **100** that receives a videoconferencing stream. In this example, metadata engine **206** identifies metadata as a result of an analysis of one or more received and/or transmitted videoconferencing streams, however, metadata may be identified from any suitable source. Metadata engine **206** may access a local database to identify metadata associated with a video conferencing stream. Locally stored business cards may be one such example. Metadata engine **206** may also access remote databases, or other information sources, such as those stored in the Internet or somewhere in network **102**, to identify metadata associated with a videoconferencing stream. For example, metadata engine may access a profile of a participant **104** stored on a website, such as LinkedIn or Facebook. Metadata engine **206** may also search news databases/websites or general search engines, such as Google, to collect information. This information may then be processed in any suitable way. For example, this information may be presented directly, parsed to extract pertinent information, operated on to produce a different format (e.g., creation of a table of gathered data), or included as a database keyword to access information in other databases that may be presented as metadata. The results of any of the preceding may be presented as metadata.

Metadata engine **206** may accept input from a person to carryout their functions. This person may be a participant **104** or a non-conference participant, e.g. an executive assistant. In any case, the input may come from a person at any site **100** or beyond. This input may be in the form of finally displayed metadata, such as a name of a participant **104**. Alternatively, this input may be in the form of criteria for identifying attributes and metadata. For example, a person may direct metadata engine **206** and/or metadata engine **206** to use a certain database or certain thresholds when performing face, voice, or location recognition.

Stream creator module **208** includes any suitable hardware, software, or both that operate to incorporate received videoconferencing streams and identified metadata into a combined video conferencing stream in any suitable manner. The combined video conferencing stream may include information not previously present in the received videoconferencing stream. Stream creator module **208** coordinates with presentation module **210** to combine received videoconferencing streams with identified metadata and to present them to participants **104** at a particular site **100**. Stream creator module **210** may do this by creating a second video conferencing stream to be displayed at a particular site.

Presentation module **210** includes any suitable hardware, software, or both that operate to present a combined videoconferencing stream to participants **104** at a particular site **100**. Presentation module **210** may direct videoconferencing equipment **106** to present the appropriate information in accordance with the description provided for video conferencing equipment above with respect to FIG. **1**. For example, any portion or all of the identified metadata may be presented during a videoconference. Presentation may be by any suitable manner, such as displaying metadata overlaid on top of

the received videoconferencing stream or on a separate display. In certain embodiments, metadata may appear as bulleted points in a presentation-style format. As another example, metadata may be presented as audio at a particular site.

Modifications, additions, or omissions may be made to conferencing agent **116** disclosed herein without departing from the scope of the invention. For example, the operations of the metadata engine **206** may be performed by multiple components. Additionally, the operations of stream creator module **208** and presentation module **210** may be performed by one component. As another example, conferencing agent **116** may include local memory for storing and accessing metadata.

FIG. **3** is a flowchart of an example method **300** for presenting metadata associated with a videoconferencing stream. The method begins at step **301**, where a videoconference begins. During this step, one or more sites, such as sites **100**, may begin transmitting and receiving videoconferencing streams. Certain metadata may be identified before or during the startup process for the videoconference as described above with respect to FIG. **2**.

At step **302**, it is determined whether a videoconferencing stream is still being received. If not, the method ends. If the videoconferencing stream is still on-going, a second videoconferencing stream is created from the received stream at step **304**. In certain embodiments, the second stream may be a duplicate of the received stream. At step **306**, the method determines whether a change has occurred in the received stream. Example changes include a change from one speaker to another speaker, a change from one person being displayed to another person being displayed, or a change in the subject matter of the conversation of the video conference. If no change has occurred, the second stream is presented with any previously identified metadata at step **308**. The second stream may also present continually changing metadata such as a stock ticker or news ticker. The stock ticker or news ticker may be inserted into the received videoconferencing stream to create a new stream. The method then loops back to step **302**.

If it is determined that a change has occurred at step **306**, the received and/or transmitted stream is further analyzed to identify attributes associated with the stream at step **310**. Examples of the types of analysis that may be performed are described above with respect to metadata engine **206**. In coordination with the analysis performed in step **310**, new metadata associated with the received stream is identified at step **312**. This step may also involve determining whether metadata currently presented is now stale or irrelevant, such that it should be removed from the second videoconferencing stream. At step **314**, the newly identified metadata is incorporated into the second stream. The method continues by presenting the second stream including the newly identified metadata at step **316**. The method then loops back to step **302**.

Modifications, additions, or omissions may be made to method **300** without departing from the scope of the invention. The methods may include more, fewer, or other steps. For example, method **300** may include a step for determining whether a participant has requested an analysis to be performed on-demand. Method **300** may also include a step where input is accepted from participants **104** or non-conference participants. As another example, method **300** may exclude step **306**. For example, method **300** may indentify metadata periodically according to a predetermined schedule. Additionally, method **300** may identify metadata using a transmitted videoconferencing stream in addition to or instead of any received videoconferencing streams. In certain embodiments, method **300** may identify metadata without analyzing the content of any videoconferencing stream. In these embodiments, method **300** may identify metadata from other sources, such as an e-mail, business card or vCard, or any other suitable source. Additionally, steps may be performed in any suitable order. For example, a second videoconferencing stream may be created in step **304** after determining whether a change has occurred at step **306**.

A component of the systems and apparatuses disclosed herein may include an interface, logic, memory, and/or other suitable element. An interface receives input, sends output, processes the input and/or output, and/or performs other suitable operation. An interface may comprise hardware and/or software.

Logic performs the operations of the component, for example, executes instructions to generate output from input. Logic may include hardware, software, and/or other logic. Logic may be encoded in one or more tangible media and may perform operations when executed by a computer. Certain logic, such as a processor, may manage the operation of a component. Examples of a processor include one or more computers, one or more microprocessors, one or more applications, and/or other logic.

In particular embodiments, the operations of the embodiments may be performed by one or more non-transitory computer readable media encoded with a computer program, software, computer executable instructions, and/or instructions capable of being executed by a computer. In particular embodiments, the operations of the embodiments may be performed by one or more computer readable media storing, embodied with, and/or encoded with a computer program and/or having a stored and/or an encoded computer program.

A memory stores information. A memory may comprise one or more non-transitory, tangible, computer-readable, and/or computer-executable storage media. Examples of memory include computer memory (for example, Random Access Memory (RAM) or Read Only Memory (ROM)), mass storage media (for example, a hard disk), removable storage media (for example, a Compact Disk (CD) or a Digital Video Disk (DVD)), database and/or network storage (for example, a server), and/or other computer-readable medium.

Although this disclosure has been described in terms of certain embodiments, alterations and permutations of the embodiments will be apparent to those skilled in the art. Accordingly, the above description of the embodiments does not constrain this disclosure. Other changes, substitutions, and alterations are possible without departing from the spirit and scope of this disclosure, as defined by the following claims.

What is claimed is:

1. A method for presenting metadata during a video conference, comprising:

receiving a first video conferencing stream from a first site;

identifying metadata associated with the first video conferencing stream by performing face, voice, or location recognition;

creating, using a processor, a second video conferencing stream incorporating the identified metadata, wherein the identified metadata comprises a name of a first person being displayed;

presenting the second video conferencing stream at a second site;

identifying a topic being discussed in the first video conferencing stream and a third video conferencing stream originating from the second site based at least in part on image recognition performed on the first video conferencing stream and the third video conferencing stream to

facilitate identifying the topic being discussed in the first video conferencing stream and the third video conferencing stream;

detecting a change that occurs in the first video conferencing stream from the first person being displayed to a second person being displayed;

automatically identifying, in a database remote from the second site, supplemental metadata associated with the first video conferencing stream according to the change and according to the identified topic being discussed in the first video conferencing stream and the third video conferencing stream;

updating, using the processor, the second video conferencing stream incorporating the identified supplemental metadata, wherein the supplemental metadata comprises a name of the second person being displayed; and

presenting the updated second video conferencing stream at the second site.

2. A method for presenting metadata during a video conference, comprising:

receiving a first video conferencing stream from a first site;

identifying metadata associated with the first video conferencing stream;

creating, using a processor, a second video conferencing stream incorporating the identified metadata and the first video conferencing stream;

identifying a topic being discussed in the first video conferencing stream and a third video conferencing stream originating from a second site based at least in part on image recognition performed on the first video conferencing stream and the third video conferencing stream to facilitate identifying the topic being discussed in the first video conferencing stream and the third video conferencing stream;

identifying supplemental metadata associated with the first video conferencing stream received from the first site in response to detecting a change in the first video conferencing stream and according to the identified topic being discussed in the first video conferencing stream and the third video conferencing stream; and

presenting the second video conferencing stream with the supplemental metadata at the second site.

3. The method of claim **2**, wherein analyzing the first video conferencing stream comprises performing face, voice, or location recognition.

4. The method of claim **2**, the method further comprising identifying metadata in a database remote from the second site.

5. The method of claim **4**, wherein the database remote from the second site comprises at least a portion of a website.

6. The method of claim **2**, wherein identifying metadata associated with the first video conferencing stream comprises receiving input from a person.

7. The method of claim **2**, wherein presenting the second video conferencing stream comprises displaying the identified metadata on a display.

8. The method of claim **2**, wherein the identified metadata comprises information associated with dynamics of a conversation.

9. The method of claim **2**, wherein presenting the second video conferencing stream comprises playing audio metadata at the second site.

10. A non-transitory computer readable medium storing logic, the logic operable when executed by one or more processors to:

receive a first video conferencing stream from a first site;

identify metadata associated with the first video conferencing stream;

create, using a processor, a second video conferencing stream incorporating the identified metadata and the first video conferencing stream;

identify a topic being discussed in the first video conferencing stream and a third video conferencing stream originating from a second site based at least in part on image recognition performed on the first video conferencing stream and the third video conferencing stream to facilitate identifying the topic being discussed in the first video conferencing stream and the third video conferencing stream;

identify supplemental metadata associated with the first video conferencing stream received from the first site in response to detecting a change in the first video conferencing stream and according to the identified topic being discussed in the first video conferencing stream and the third video conferencing stream; and

present the second video conferencing stream with the supplemental metadata at the second site.

11. The non-transitory computer readable medium of claim **10**, wherein the analysis comprises face, voice, or location recognition.

12. The non-transitory computer readable medium of claim **10**, wherein the identified metadata comprises information associated with dynamics of a conversation.

13. The non-transitory computer readable medium of claim **10**, wherein the logic is further operable to play audio metadata at the second site.

14. A system for presenting metadata during a video conference, comprising:

a communication module operable to receive a first video conferencing stream from a first site;

a metadata engine operable to:

identify metadata associated with the first video conferencing stream;

identify a topic being discussed in the first video conferencing stream and a third video conferencing stream originating from a second site based at least in part on image recognition performed on the first video conferencing stream and the third video conferencing stream to facilitate identifying the topic being discussed in the first video conferencing stream and the third video conferencing stream; and

identify supplemental metadata associated with the first video conferencing stream received from the first site in response to detecting a change in the first video conferencing stream and according to the identified topic being discussed in the first video conferencing stream and the third video conferencing stream;

a stream creator module operable to create, using a processor, a second video conferencing stream incorporating the identified metadata and the first video conferencing stream; and

a presentation module operable to present the second video conferencing stream at the second site with the supplemental metadata.

15. The system of claim **14**, wherein the analysis comprises face, voice, or location recognition.

16. The system of claim **14**, wherein the identified metadata comprises information associated with dynamics of a conversation.

17. The system of claim **14**, wherein the presentation module is further operable to play audio metadata at the second site.

18. The method of claim **1**, wherein analyzing the first video conferencing stream and the third video conferencing stream to identify the topic comprises performing image recognition on the first video conferencing stream and the third video conferencing stream to facilitate identifying the topic being discussed in the first video conferencing stream and the third video conferencing stream.

19. The method of claim **2**, further comprising presenting the second video conferencing stream with the supplemental metadata at the second site while receiving the first video conferencing stream and in response to detecting the change in the first video conferencing stream.

20. The non-transitory computer readable medium of claim **10**, the logic further operable to present the second video conferencing stream with the supplemental metadata at the second site while receiving the first video conferencing stream and in response to detecting the change in the first video conferencing stream.

21. The system of claim **14**, the presentation module further operable to present the second video conferencing stream at the second site with the supplemental metadata while receiving the first video conferencing stream and in response to detecting the change in the first video conferencing stream.

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